Enida, which I have recently discovered, and in the species *Eburna japonica* and *Haliotis japonica.*

The remainder, or possibly the greater part, of the Molluscan inhabitants have been introduced by foreign immigrations from the north, south, and west.

1. *Boreal or Northern Forms.*

These have travelled from the Sea of Okhotsk, passing through the Strait of La Pérouse, and, following the prevailing cold current, according to our observations, have distributed themselves along the coast of Manchuria and the shores of Yesso. Some of these, for example *Cryptochiton Stelleri* and *Littorina grandis,* may have been derived from the Shantar Sea, having passed through the Gulf of Amur into the Gulf of Tartary.

2. *Indo-Chinese or Southern Forms.*

These, issuing from the China, Eastern, and Yellow Seas, have entered by the Korea Strait, and, following the prevailing warm current along the shores of Niphon, have spread themselves over the Sea of Japan, mingling with species from the north and west.

3. *Pacific or Western Forms.*

These mollusks have crossed the North Pacific Ocean, and passed into the Sea of Japan by the Straits of Tsuka and La Pérouse. Among them may be instanced *Saxidomus Nuttalli* and *Gemma gemma.* Saghaleen has derived some species from Sitka, the Manchurian coast from Oregon, and the islands of Yesso and Niphon from California.

I can say nothing from personal observation concerning the influence of the gulf stream of the North Pacific, but possibly during the summer of the present year I may have an opportunity of visiting the western coast of Niphon.

Shanghai, China, May 15, 1861.

XXXIV.—*On a Species of* Rüppellia, *Milne-Edwards, and the Limits of the* Brachyura. By Dr. Strahl*.

Dana, in his work on the Crustacea, describes a *Rüppellia* which he identifies, with doubt, with *R. annulipes,* M.-E. The figure given by him facilitates a comparison with the statements of Milne-Edwards. Dana's *Rüppellia* is evidently a new species, and not to be identified with any one of Milne-Edwards's three species. The species described as *Rüppellia annulipes* by Dana

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* Translated from the Monatsbericht der Königl. Akad. der Wiss. zu Berlin, November 1861, p. 1004.

I propose to name *R. truncata,* because the frontal margin is not distinctly toothed, but almost entirely smooth as in *R. vinosa,* M.-E. *R. truncata* is further distinguished from *R. annulipes,* and also from *R. vinosa,* by the lower margin of the orbit bearing four small teeth, and from *R. annulipes,* M.-E., by the want of the horizontal ridge upon the teeth of the lateral margin, by which the latter is specifically distinguished.

The genus *Rüppellia* consequently includes four well-marked species. The *Cancer Calypso,* Herbst, which Milne-Edwards supposed might belong to *Rüppellia,* belongs to the genus *Pilumnoides,* Dana. *Rüppellia* is most nearly allied to *Ozius,* Leach; for, besides that, as Dana has already pointed out, the *spatium prælabiale* is distinctly divided on each side by a longitudinal seam, and the efferent canal of the branchial canal thus bounded, corresponding to the anterior margin of the third joint of the external maxillipeds, exhibits a round emargination, the form of the first joint of the external antennæ agrees in *Ozius* and *Rüppellia;* this joint, in its course from behind forwards, is bent in the form of a knee from within outwards. The agreement in external structure is so great in the two genera that they might conveniently be united in a single one, but for the presence of a distinction which refers each of these genera to a particular division. Thus, in *Rüppellia* the pterygostomium and forehead come so close together that the orbit is thereby completely closed internally, as in *Eriphia* and *Trapezia;* whilst these parts in *Ozius* leave a cleft between them, in which, as in the allied genera *Galene, Pilumnus,* &c., the moveable portions of the external antennæ conceal themselves.

Dana's *Ozinæ* enable the *Eriphinæ* to be approximated to the *Xanthinæ* and *Chlorodinæ,* in so far as in the *Ozinæ, Xanthinæ,* and *Chlorodinæ,* and likewise in the *Portunidæ,* the pterygostomium never closely approaches the forehead, and completely closes the orbit internally, but a wider or narrower cleft always remains here; if the orbit be nevertheless closed internally, this is always effected by the first joint of the external antenna, which is then of large size, as in *Melissa* (*Euxanthus,* Dana), *Etisus, Thalamita.* The *Eriphinæ* might probably be arranged next to the *Oxyrhyncha,* which I formerly limited more accurately as *Brachyura perfusa;* in the latter the amalgamation of the pterygostomium with the first joint of the external antenna and with the epistomium effects the complete closure of the orbit, and the second joint of the antenna is always inserted at the summit and in front of the orbit.

As I have already indicated, the group of *Brachyura incuneata* established by me includes by far the greater part of the Brachyura; and decided differences of organization call for a further division of them. The *Incuneata* break up into the *Cancroidea, Grapsoidea,* and *Leucosiæ.* The structure of the maxillipeds and respiratory apparatus, and also the position of the male sexual organs, are the grounds of this classification. Dana has set up the *Corystoidea* also as a peculiar type; but these must be united with the *Cancroidea* with even more justice than the *Thelphusinæ,* especially as the most multifarious transitions occur within the *Cancroidea,*—as the genera *Paraxanthus,* Lucas, *Platycarcinus,* M.-E., and *Perimela,* Leach, unless the last-mentioned genus must be entirely removed to the *Corystoidea.*

The *Leucosiæ* I consider to include only Dana's *Leucosidæ,* with *Dorippe* and *Æthusa.* I separate the *Calappidæ* and *Matutidæ* from them, and unite them with the *Parthenopinæ* rejected from the *Oxyrhyncha,* whilst *Oncinopus* must be placed amongst the *Liberata* in the neighbourhood of *Hymenosoma.* This combination is justified by the agreement in the situation of the afferent canal of the branchial cavity and of the male sexual organs; and a close affinity is also shown by the strongly keeled claws, of which the hands are usually long: moreover, the forehead is not divided at the point of attachment of the first joint of the external antenna, but this joint is merely squeezed in between the pterygostomium and the first joint of the inner antenna, the other parts of it are fully moveable, and thus, as it were, a step is made towards the *Liberata.* In this section the *Parthenopinæ* approach nearer to the Cancroid type, and the *Matutidæ* and *Calappidæ* to the Leucoside type, in regard to the structure of the outer maxillipeds. Here belongs undoubtedly the genus *Zebrida,* Adams and White, as appears from the figure in the 'Voyage of the Samarang,' and, with some doubt, also *Harrovia,* Adams and White, of which no inferior view is given. The same arguments apply to *Ceratocarcinus* and *Gonatonotus,* Adams and White; nevertheless *Gonatonotus* appears rather to be Cancroid so far as the form of the claws allows one to judge. In estimating the relations here indicated by me, both figures and descriptions unfortunately frequently fail one.

The *Grapsoidea* are formed naturally only of those of Dana's *Grapsoidea* which remain after the separation from them of the families formerly named by me as *Liberata.* The genus *Grapsus,* limited by the rejection of *Leptograpsus, Metopograpsus,* &c., and represented by the species *Pharaonis, strigosus, Webbii,* &c., must be removed not only out of the *Grapsoidea,* but even entirely out of the Brachyura, because the structure of the external antennæ differs completely from that which prevails amongst the Brachyura. *Grapsus,* namely, has no operculum at the base of the external antennæ, but a perforated tubercle, as in the Macrura, and must therefore at least be placed among the Anomura, somewhere in the vicinity of the *Dromidæ*; in any case it forms a particular section, on account of the position of the female sexual organs.

The external antenna is not suspended immediately from the cephalothorax, like the internal antenna, but by means of an articular piece, which is called "*article basilaire*" by Milne-Edwards in the Macrura. This articular piece is not a complete ring, but only a half-ring, which moves by its ends in a hinge-joint, and fulfils a double function. It not only bears the external antenna with its subsidiary organ, the antennal scale, but also contains the efferent orifice for the secretion of Suckow's gland. The latter point has been confirmed by the malformation discovered by me, and described in Reichert and Du Bois-Reymond's 'Archiv' (1859, p. 333), but I wait for further corroboration. In all Macrura and Anomura this articular piece possesses a *tubercle*, which is perforated at the summit and closed by a membrane, the so-called *tympanum*. But this tympanum has a slit in its centre, which may be opened and closed by muscular action. This slit leads, by a tube of greater or less length, to the so-called auditory vesicle, which collects the secretion of the green gland.

This structure is shown by the articular piece throughout, even if the antennal scale be entirely wanting, as in the *Palinuridæ*, the *Scyllaridæ*, the *Galatheidæ*, the *Porcellanidæ*, the *Hippidæ*, and the *Raninidæ*. In the *Porcellanidæ* this piece is still of considerable size, but in the *Dromidæ* it becomes so shrunken that essentially only the tubercle remains, but this fully developed. In *Dromia* the tympanal membrane is very small, but still the slit is apparent; and *Grapsus* sensu strictiore has the same structure. The Brachyura show no trace of antennal scale; and from the *Dromidæ* to them is only a step. Thus, if we imagine the slit in the tubercle of *Dromia* carried out to one side, so that here the peripheral margin is completely separated, we have the operculum of the Brachyura in its perfect form: for this operculum by no means possesses a construction comparable to that of the stapes in the auditory organs of the higher animals; it is rather a valve, which is attached externally to the pterygostomium, and can be opened in the direction of the median line of the animal; its opening and closing is subject to the will; and for this purpose the operculum possesses on its inner margin a manubrium ascending into the interior of the animal, to which the muscles are attached. I have fully investigated this structure in both *Carcinus Mænas* and *Platycarcinus Pagurus*, and found in these also that a reservoir is reached, likewise situated in front of the stomach, and connected with a glandular organ, which is the apple-green organ (Suckow's gland).

If *Grapsus* is to be entirely removed from the Brachyura, the name *Grapsoidea* cannot be retained for a Brachyurous group. In the group in question, *Planes*, Leach (*Nautilograpsus*, M.-E.), is the oldest genus; and I therefore provisionally give this group the name of *Planidæ*. But I also give up the name of Brachyura altogether; for *Grapsus* and the *Dromidæ* are Brachyura in respect of their abdomen. I rather group together all those Decapoda of which the external antenna exhibits an operculum, as *Opercularia*, and call all the remainder *Tubercularia*, because their outer antenna presents a tubercle. I consequently also get rid of the section Anomura, which hitherto included the forms which, in regard to the structure of the abdomen, constituted the transitions from the Macrura to the Brachyura. With respect to the structure of the external antennæ, the Anomura agree throughout with the Macrura: even the *Lithodidæ* and *Paguridæ* exhibit more or less of the antennal scale.

The Opercularia consequently include all the genera cited by Dana as Brachyura, with the exception of the genus *Grapsus* in the restricted sense; but, in compensation, the *Bellidea*, placed by Dana amongst the Anomura, fall into this group.

XXXV.—*A Catalogue of the Zoophytes of South Devon and South Cornwall.* By the Rev. THOMAS HINCKS, B.A.

[Continued from p. 207.]

Fam. **Celleporidæ.**

CELLEPORA, Fabricius.

Section α. *Encrusting, adnate.*

1. *C. pumicosa*, Linnæus.

Very common, on stones, shells, *Sertulariadæ*, &c.

This species is of very variable aspect. Sometimes it forms small oval masses on the stems of Zoophytes. This is the condition figured by Mr. Busk (Catal. pl. 110. fig. 4). When developed on the surface of shells, &c., it forms somewhat circular *mounds*, raised in the centre and sloping off towards the edge. Sometimes it occurs in irregularly-shaped porous masses, of very considerable size, involving more or less the fragment of shell or other body which constituted the original support of the polyzoary. A specimen of this description from Torbay measures about 3¼ inches in length, 2½ inches in width, and 1¼ inch in thickness.

Much as this differs in general appearance from the smaller